REMARKS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-14 are pending in the present application. Claims 1-3, 5-8 and 10-12 are amended by the present amendment.

In the outstanding Office Action, Claims 1 and 6 were rejected under 35 U.S.C. § 102(e) as anticipated by Singh (U.S. Patent No. 6,204,860). Claims 2 and 7 were rejected under 35 U.S.C. § 103(a) as unpatentable over Singh in view of Konno (U.S. Patent No. 6,198,979). Claims 11-14 were allowed, and Claims 3-5 and 8-10 were indicated as allowable if rewritten in independent form.

Applicants thank the Examiner for the indication of allowable subject matter.

Claims 1 and 6 were rejected under 35 U.S.C. § 102(e) as anticipated by Singh. That rejection is respectfully traversed.

Independent Claim 1 is directed to a method of generating a free-form surface model that includes applying a linear transformation to a lattice polygon model to generate vertices of a free-form surface model corresponding to respective vertices of the lattice polygon model, and generating control points of cubic Bezier curves that connect the vertices of the free-form surface model and that correspond to respective edges of the lattice polygon model.

Independent Claim 6 is directed to a computer-readable memory medium having a program embodied therein for causing a computer to generate a free-form surface model. The program includes program code units configured to apply a linear transformation to a lattice polygon model to generate vertices of a free-form surface model corresponding to respective vertices of the lattice polygon model, and to generate control points of cubic Bezier curves that connect the vertices of the free-form surface model and that correspond to respective edges of the lattice polygon model.

In a non-limiting example, Figures 10 and 11 illustrate a construction method for a free-form surface model. A vertex-calulation unit 10 calulates vertices of the free-form surface model that corresponds to vertices of a lattice polygon model using a linear transformation of coordinates of the original vertices (page 11, lines 13-21). An edge-determination unit 20 determines edge geometries of the free-form surface model that correspond to edges of the lattice polygon model (page 11, line 22 – page 12, line 8). A free-form-surface-generation unit 30 interpolates Gregory free-form surfaces into the free-form surface model comprised of cubic Bezier curves (page 12, lines 9-15). The free-form surface model has the same topology as the original lattice polygon model, thereby allowing reconstruction of the original lattice polygon model (page 12, line 14 – page 13, line 16). Since the accurary of the resulting free-form surface model is essential, the lattice polygon model has a one-to-one correspondence with the free-form surface model, thereby improving the accuracy of the resulting free-form surface mode. Thus, the lattice structure requires a relatively small data size to generate a high quality free-form shape.

Conversely, Singh discloses a deformation primitive, referred to as a "wire curve", used for effecting geometric object deformation and essentially a method for controlling object deformations (column 3, lines 44-47). The wire curves resemble the actual physical wire armatures used in sculpting and provide a course approximation to the shape of the object being modeled (column 3, line 65 – column 4, line 18, and column 6, lines 22-24). Singh discloses a lattice as an approximated modeling primitive for controlling geometric deformations of an underlying object (column 13, lines 12-23). Singh does not teach or suggest a method of generating a free-form surface model, involving applying linear transformation to a lattice polygon model. Instead, Singh teaches that the wire curve need not even be located on the surface of the object, but rather only be in the vicinity of the underlying object. Singh teaches a method for controlling object deformation, rather than a

method for generating or interpolating a free-from surface model from a lattice polygon model (column 3, lines 44-47).

Additionally, Singh does not teach or suggest a polygon model. Instead, Singh discloses disconnected wires, many of which are curved (Figures la-c and 21d-f), whose manipulation deforms the surface of an associated object in the proximity of the curve (column 4, lines 28-29). Singh discloses course approximations of the underlying object and wire deformations that are independent of the complexity of the underlying model. Further, the vertices and edges of these wire primitives do not necessarily correspond to the curved surfaces (column 4, lines 8-12).

Thus, Singh uses curved wires to deform underlying objects, unlike the claimed invention that uses lattice polygon models to generate accurate curved surfaces.

Accordingly, it is respectfully requested this rejection be withdrawn.

Claims 2 and 7 were rejected under 35 U.S.C. § 103(a) as unpatentable over Singh in view of Konno. That rejection is respectfully traversed.

Konno does not overcome the above-noted deficiencies of Singh. Additionally, dependent Claims 2 and 7 depend from independent Claims 1 and 6, respectively. Accordingly, it is respectfully requested this rejection be withdrawn for similar reasons as discussed above.

Thereby, each of the independent Claims 1 and 6, and the claims dependent therefrom patentably define over Singh and Konno. Accordingly, it is respectfully requested that this rejection be withdrawn.

Additionally, Applicants submit that the amendments to Claims 1-3, 5-8 and 10-12 are not believed to be more narrow those claims in scope in any aspect compared to original Claims 1-3, 5-8 and 10-12.

Consequently, in light of the above discussion and in view of the present amendments, the present application is believed to be in condition for allowance, and early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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